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ABSTRACT

The effectiveness of four operant procedures (differential reinforcement of incompatible behavior, omission training, overcorrection, and reinforcement withdrawal) in changing self injurious behavior (SIB) of 16 severely handicapped students was examined. Analysis of correlations between reduction in SIB and subject characteristics, adaptive behavior changes, and enviornmental stimulation suggested three recommendations for treatment: 1) the child should be programed in a social and educational interaction as much as possible, with materials and commands programed in a gradated fashion to avoid aversiveness; 2) a punishment procedure should be contingently applied with the appearance of SIB; and 3) maximally reinforcing stimuli should be identified and contingently applied to on-task responses. Phase 2 of the study showed that teachers and parents were effective behavioral recorders and modifiers in dealing with SIB. (CL)

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Annual Report

Project No. 443CH70586
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THE DEVELOPMENT OF TREATMENT TECHNIQUES FOR THE REMEDIATION OF SELF-INJURIOUS BEHAVIOR IN THE CLASSROOM AND HOME

Dr. Robert J. Gaylord-Ross

Yeshiva University

New York, New York 10003

December 1977

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Dr. Robert Gaylord-Ross
Special Education Department
Yeshiva University
55 Fifth Avenue
New York, New York 10003

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INTRODUCTION

Statement of the Problem

Self-injurious behavior (SIB) is an extreme form of psychopathological behavior appearing among a number of severely handicapped individuals. Definitionally, SIB involves repeated and chronic, self-inflicted responses where potential or real tissue damage may occur. The types of self-mutilitative responses frequently observed are head-banging, face-slapping, self-biting, hair-pulling, and scratching. Thus, SIB differs from suicidal acts of self-destruction in that it is not episodic and it is rarely fatal.

SIB poses two critical problems for the individual. First, it obviously is threatening to the physical health of the person. Besides cuts, bruises, and infections that may result, some cases have been reported where there has been a loss of sight and excision of parts of the body, e.g., biting away part of the lip. In addition, when the individual is preoccupied with SIB there is little chance that substantive learning will take place. Therefore, the person remains at a rather low level of human development. As will be seen below, one treatment strategy is to increase the number of skills in a person's repertoire so that the emission of constructive responses will compete with SIB. Any truly effective treatment would simultaneously accelerate constructive responses as well as decellerate the frequency of SIB.

The importance of finding treatment techniques that can reduce or eliminate self-injury can be viewed in another light. In the past, the appearance of SIB or other severe aberrant behaviors has led to the institutionalization of many handicapped persons. Given the current national trend of deinstitutionalization, it will be important that many aberrant behaviors like SIB can be reduced to reasonable levels so that successful community adjustment can take place. It is one of the objectives of the present project to develop effective treatment procedures to reduce SIB in a community-based context, i.e., the school and the home of the child.

Although a number of theoretical views have been advanced to analyze the etiology of SIB, e.g. psychoanalysis, the operant or behavior modification approach has produced nearly all of the published treatment efforts to eliminate this syndrome (Carr, 1977; Bachman, 1972). The operant approaches have typically tried to manipulate specific consequating events so that either the SIB is punished or some alternative behavior is positively reinforced. Reported studies have typically been of the case study variety where a single treatment approach is shown to successfully suppress the SIB. There has been a noticeable absence of studies that compare the differential treatment effectiveness of a number of techniques with a larger group of clients. To this end, the present study is committed.

Purpose and Objective of the Project

The major objectives of the project have already been stated. That is, an attempt was made to empirically identify the most effective treatment procedures in reducing self-injury. The research is of an "applied" sort in

that it attempts to develop treatment techniques that can be implemented by actual classroom teachers and parents. In this context the project is consistent with the principles of normalization and the government's mission to develop maximally effective community-based residential and educational services for the handicapped.

More specifically, the research applies a within-subjects design so that all clients receive successive exposure to four operant procedures that have demonstrated considerable success in reducing SIB in past studies. In order to make generalizations about the most effective treatment procedure (s) a number of clients were "run" through the design. It is possible that one particular procedure will <u>not</u> emerge as the most effective techniques across subjects. In this case, in addition to an analysis of individual data patterns, an attempt was made to identify particular subgroups of self-injurious persons that are differentially sensitive to particular treatment packages. That is, aptitude x treatment interactions are investigated.

In addition to the experimental, operant manipulations made, a number of secondary data sources were obtained. This evidence was correlational in nature. It examined the correlations between reduction in SIB and: subject characteristics, adaptive behavior changes, and environmental stimulation. Thus, self-injury was examined from a number of perspectives including the operant framework. Data and interpretation of the first year's results are presented. Also, modifications or additional data probes to be used in the second year of funding are described. Specifically, while the results from the first funding year are promising, an effort will be made in the second year to monitor skill acquisition as well as SIB reduction. This approach follows the guideline stated above to not only decellerate aberrant behavior but also to accelerate constructive behaviors.

ESTABLISHMENT OF THE PROJECT STAFF

The staff were largely obtained from Yeshiva University graduate students in special education and psychology. All personnel had previous experience with severely handicapped children. Overall, I was quite pleased with the quality and quantity of effort of the staff members. There were no complaints from the school sites about how the project staff conducted themselves. In a number of cases, in fact, there was enthusiastic praise for the efforts of the staff person. In two cases, staff members left the project because they obtained better paying (and probably less arduous) employment.

In the grant proposal the staffing pattern had called for one full-time project director, three half-time trainers, and a quarter-time principal investigator (PI). At the start of the project a reorganization in this pattern was made in order to (1) run more subjects through the experimental design, and (2) manage and analyze the large, accumulating data base. The reorganization called for four half-time trainers and one half-time data analyst, as well as a quarter-time PI. This staffing pattern worked quite well except that it required the PI to take on many of the field-based supervisory activities intended for the full-time project director. Therefore, two thirds through the school year another staffing change was made. After a particular trainer was finished running her children through the experimental design, her role was changed to a project coordinator. The project coordinator consulted with the trainers at the various sites in both New York City and Syracuse, NY. Thus, the latter third of the school year finished with 3 trainers (half-time), one data analyst (half-time), one project coordinator (half-time), and one PI (quarter-time). During the two summer months data was analyzed and synthesized by the data analyst, project coordinator, and PI.

IDENTIFICATION OF SUBJECTS

It has been estimated that there are between .2% and .9% of the general population that are severely handicapped. Within this low incidence, handicapping condition there is a subgroup of self-injurious persons. Estimates of self-injurious persons vary, by a recent study by Schroeder and Humphrey (1977) reported that 10% of an institutional population that was almost exclusively severely/profoundly retarded, was self-abusive. Other estimates of self-injurious persons in similar institutional populations have varied but they typically range between the 10%-20% mark. While no similar epidemiological studies have been done with community-based samples, it could be predicted that there would be a lower incidence of this type of syndrome with noninstitutionalized groups. This prediction is based on the fact that extreme behavioral pathologies like self-injury have often been the cause of institutionalization. Secondly, it is likely that the environmentally deprived conditions existing on many back wards that appear to lead to extreme forms of aberrant behavior, would not be extent in community settings.

In either case, I am referring to a rather small population when the sample is limited to noninstitutionalized persons that are chronically self-abusive. Since this study attempted to work with approximately 30 self-injurious children over the two-year funding period, a sample of this size could probably only be identified in a large metropolitan area like New York City.

The strategy for obtaining subjects was for the PI to make phone calls to the directors or principals of schools in the New York City area that served severely handicapped children, e.g., severely/profoundly retarded, autistic, neurologically impaired. Though a number of schools were willing to cooperate with the project, upon closer examination, they failed to have children that were chronically self-abusive. If the school administrator and staff indicated they were interested in collaborating, they were sent a copy of the proposal. The PI then visited the school, met with the staff, and observed particular children. A decision rule was made that at least two children at the school had to be chronically self-injurious. Ideally, the TR (half-time research assistant affiliated with the project) would work with three children at one time. A minimum of two children was required, though, to make the collaboration cost-effective in terms of collecting data on the stated number of subjects, with the given number of staff, and within the two year funding period.

Given this procedure, three schools were initially identified to be affiliated with the project. They were:

1. The Queens Developmental Center; Queens, NY.
2. The Association for Blind and Retarded Children; Queens, NY.
3. The Brooklyn School for Special Children; Brooklyn, NY.

All of the schools had day school programs serving students predominantly from noninstitutional settings. A total of 11 children were used from these three schools throughout the school year (September 1976-June 1977). Letters of permission from a parent (PR) or guardian were obtained for all children participating in the project (see Appendix A).

In this particular study, PRs would necessarily give written permission because they also had to agree to be active participants in the project.

In addition to these three schools, contact was made by the PI during the course of the year with the school psychologist at the school run by the Onondaga Association for the Retarded (Syracuse, NY). They had four self-abusive children that were similarly run through the project design. Fortunately, individuals serving as TRs at the Syracuse school were obtained on a volunteer or practicum basis from Syracuse University. Both TRs and teachers (TC) at the school received training and follow-up visits from the PI. An effective long-distance relationship was sustained through such visits, phone calls, and the sending of data through the mail.

START-UP AND OPERATIONS

After subjects and school sites were successfully identified, the (TRs) were assigned to the particular school on a daily (five days per week) basis. The PI initially trained the TRs in correct procedures and methodology. Then, the TRs instructed the cooperating TCs and PRs in proper techniques (see Appendix A for recording instructions). The TRs thereafter had: daily half-hour treatment sessions with the child, consulted with TCs on technique and measurement matters, and made similar consultations in the homes of the children. The TR ran a number of preliminary observation sessions to see if the targeted children had sufficient frequency counts of SIB to warrant further treatment. In two cases, students were dropped from further study on these grounds.

The project began after training was completed, written permission was obtained and the child was empirically validated to be self-injurious. The TR, TC, and PR simultaneously began recording sessions on the same day. In this multiple baseline design (see Figure 1) TR, TC, and PR ran half-hour observation sessions at the same time each day. The TR and TC sessions were held in the child's classroom and the PR sessions were in the home. Sessions were not to be held when the child was eating or sleeping. During phase I when PRs and TCs were solely doing baseline recordings, they were told not to interrupt their normal activities. They were only to make sure that the child was in their line of vision throughout the entire half-hour session. Three materials were given and explained to TC and PR. They were the recording sheet (Appendix A), a golf counter, and a kitchen timer. They were told to set the timer to 30 minutes, record the number of self-injurious responses on the golf counter, and when the session ended, make written entries of response frequency on the recording sheet. The TR picked up the recording sheets and did reliability checks on a weekly basis. The accumulating data were entered on the consolidated recording sheet (Appendix A) by the TR. Consolidated data sheets were photoduplicated and subjected to graphical and statistical analysis by another research assistant.

Secondary Measures

Besides the primary data collected on SIB, there were a number of secondary data sources collected for the purpose of finding intercorrelations between them and changes in SIB. The TRs obtained the data from the schools and PRs, which in turn were statistically analyzed by another research assistant. A number of characteristics about the subject were obtained from the Comprehensive Data Sheet (Appendix A). Such information included age, primary diagnostic classification, length of appearance of SIB, etc. The second measure was the Progress Assessment Chart (PAC) (Gunzberg, 1973). The PAC is an index of adaptive behavior level that was administered on a pre- and post- basis. Scores were obtained on a number of functional domains like self-care, communication, gross motor, fine motor, and socialization. The third measure was the HOME inventory (Caldwell, 1967). The HOME gives an index of environmental enrichment in the domicile of the child. The PAC was filled out by the TC. On items the TC was unable to answer, the assistance of the PR was sought. The HOME was filled out by the TR based on a particular visit to the domicile of the child.
Examples of the PAC and HOME assessment devices are in Appendix B.

DESIGN AND TREATMENT PROCEDURES

Design

The present project was designed to have two phases. In Phase 1 the TR would expose the child to four treatment procedures. During this time the TC and PR would take ongoing baseline recordings without an actual treatment intervention. The logic behind this multiple baseline design was to detect the most effective treatment for the individual and the overall sample during the TR sessions. The baseline sessions with TC and PR were to measure generalization of treatment effects from TR sessions. After Phase 1 was completed, a second phase was to begin. In Phase 2 the TC and PR would successively apply the technique that had been most successful in Phase 1 for the individual child. Phase 2 also followed a multiple baseline design as the particular treatmentwas successfully lagged in across TC and PR (see Appendix D).

In Phase 1 the subject was initially exposed to five treatment sessions of Baseline 1 (B1). B1 consisted of the TR observing the child from a distance in the actual classroom. The child participated in normal classroom activities and there was no interaction between TR and child. Baseline 2 (B2) always immediately followed B1. B2 consisted of five sessions where the TR engaged the child in 1:1 interaction on a particular educational task. In B2 there was no positive or negative consequation of educational or self-injurious responses. The TR tried to keep the child on task without applying any systematic reinforcement or punishment procedure. In this way, SIB during B1 could be contrasted to SIB in B2 to show the effects of 1:1 interaction on the reduction of self-injury. If one moved directly from B1 to a particular treatment procedure there would be a confoundong of reinforcement schedule with the type of interaction.

After both baseline conditions were completed the child was successively exposed to four treatment conditions. These particular conditions were selected because of their past success in decreasing rates of self-injury. Each condition was run for 10 consecutive sessions. The order of treatment presentation was varied across subjects with a Latin Square procedure. The four possible orders were:

1. DRI-OT-OC-RW
2. OT-DRI-RW-OC
3. OC-RW-DRI-OT
4. RW-OC-OT-DRI

DRI=Differential Reinforcement of Incompatible Behavior
OT=Omission Training
OC=Overcorrection
RW=Reinforcement Withdrawal

Treatment Procedures

Overcorrection. During OC sessions if the child emitted a self-injurious response the TR would immediately apply the OC procedure. OC consisted of the TR first giving the verbal command "hands down." The TR would immediately take the child's hand and hold it at his/her side for a fixed, one minute period. All of the subjects in this study were using their hands as some part of the self-abuse, i.e., head-slapping and hand-biting. If there had been head-banging, i.e., head to object movement, an OC procedure entailing movement of the head would have been applied.

The OC procedure was applied in a systematic, contingent manner. If the child emitted SIBs with the other hand when one hand was restrained, OC would then involve the restraint of both hands. The TRs were instructed to use the minimal amount of manual force in order to make the child hold their hands in the downward position. In one case, in fact, all that was eventually needed was the verbal command "hands down" and the child places her hands down without any manual prompt. During OC the TR recorded the number of OC periods.

Reinforcement withdrawal. The other procedure, besides OC, that uses contingent punishment is RW. RW involves the contingent removal of a positive or rewarding event. In this case it is hypothesized that social attention given to SIB by the child's caretakers may inadvertently reinforce and maintain the behavior. This may occur in the context of the caretaker trying to reassure the child or prevent the child from emitting any further responses. In this study RW required that the TR move away from the subject contingent upon self-injurious response. The TR ceased interaction with the child and moved approximately 15 feet away from the child. The TR's back was partially turned away from the child to further indicate the cessation of interaction. The TR still had to be looking at the child during this one minute timeout period so that accurate recordings could be made. The problem never arose that the child would pursue the TR. At the end of the one minute period the TR returned to the child and resumed on task interaction. No verbalizations were made by the TR throughout the RW procedure.

Differential reinforcement of incompatible behavior. There were two procedures involving positive consequation (versus punishment) schedules. The DRI peocedure entailed the classical, Skinnerian, positive reinforcement approach. That is, every correct, on task response by the subject received immediate positive consequation. This response-consequation procedure was carried out on a contiuous (versus intermittent) reinforcement schedule. In this way alternative, constructive behaviors were positively consequated in the hope that their frequency would increase while the SIB would concomitantly decrease.

It should be added that the actual task that was engaged during the TR sessions varied from subject to subject. Also, the reward or positive consequence varied across subjects. Verbal praise, though, was always paired with a positive consequence like food, physical caressing and rocking, or object manipulation. Contingent verbal praise was also applied in the other conditions (including B2), unless it was shown to be the most potent reinforcer for DRI. The actual reward was determined on an individual basis through pre-treatment exploration.

Omission training. The second procedure using positive consequation is OT or the differential reinforcement of other behavior. In OT the subject is rewarded for not emitting the aberrant (self-injurious) response. Initially, the length of the OT interval was set at the inverse of the rate of the SIB. That is, if the child was emitting SIB at the rate of two per minute, the OT interval would be set at 30 seconds. As the rate of self-injury decreased, the length of the OT interval gradually increased. The OT interval would typically be increased in steps from: 30 secs., 40 secs., 50 secs., one minute, one min. and 30 secs., two min., three min., four min., five min., etc. There was a specific decision rule to determine when the OT interval would be increased. When the subject had gone five straight OT intervals without a self-injurious response, the interval length was increased. This procedure continued throughout the OT condition.

RESULTS

Primary measures

Phase 1. The Phase 1 data was separately analyzed for group and individual trends. First, an indication of the treatment effects in the TR condition is reported. The means and standard deviations for the 15 subjects are presented in Table 1 . It is evident that the largest amount of SIB appeared in the B1 condition. There was a noticeable reduction in self-injury, though, from B1 to B2. Apparently the initiation of 1:1 interaction reduced the emission of self-abusive responses considerably. Overall, the RW procedure was the least effective as it was numerically equivalent to the level of responding in B2. OT was the second least effective technique, although the mean score dropped considerably from B2. DRI had slightly lower scores than OT. Clearly, the most effective procedure was OC.

It should be explained that a specific correction formula was applied to compute the SIB frequency during OC. The correction formula was used in order to prevent a spuriously low score being obtained during OC. This effect could result from the fact that during OC the subject was being contingently restrained for a fixed one minute period. During this time it was impossible for the subject to respond. Thus, for some subjects that were emitting SIBs at high rates, they could be restrained for virtually the whole half-hour session. Thus, a formula to prorate self-injurious responding was calculated. The formula was:

$$\frac{30 \times \#SIBs}{30 - \#SIBs}$$

The formula essentially calculated the rate (per minute) of self-injury during the unrestrained time (#SIB/30 - SIB) and prorated this score over the full 30 minute session.

A one-way, repeated measures, analysis of variance (ANOVA) was computed on the TR data in Phase 1. That is, the mean score for each subject in each treatment condition was the unit of measure. A reliable difference among the six treatment conditions was found, F (5, 70) = 6.13, $p < .01$. A Newman-Keuls post hoc analysis was calculated on the six treatment means. Table 1 shows the pairwise comparisons between means calculated at the .05 level. The two outcomes of this analysis were: (a) B1 was significantly larger than all of the treatment conditions except B2, and (b) OC was significantly less than B2, RW, and OT.

A similar one-way, repeated measures ANOVA was calculated on the Phase 1 treatment means for the TC and PR data. There were no reliable (significant) effects found for the TC and PR data. This would indicate that there was no significant generalization of treatment effects from the TR to the TC and PR settings.

Next, an analysis of individual subjects was carried out. Table 2 presents the type of self-injury appearing for the 15 subjects. There were two general types of responses: self-biting of the hands and arms, and

TABLE 1

Treatment Condition Means and Standard Deviations in Phase 1 for Trainer, Teacher, and Parent Settings

Treatment[1]	B1	B2	RW	OT	DRI	OC
			Trainer			
Mean[2]	140.0	96.2	96.3	65.8	61.5	31.0
Standard Deviation	183.4	142.3	209.0	75.7	88.4	49.0
			Teacher			
Mean	82.5	71.1	40.6	59.6	41.0	33.4
Standard Deviation	110.8	99.6	56.3	92.1	67.6	48.8
			Parent			
Mean	141.1	87.7	47.6	61.8	74.3	50.4
Standard Deviation	177.7	92.3	49.1	64.0	85.0	59.6

[1]Treatment abbreviations: B1=Baseline 1, B2=Baseline 2, RW=Reinforcement Withdrawal, OT= Omission Training, DRI= Differential Reinforcement of Incompatible Behavior, OC=Overcorrection.

[2]Newman-Keuls post hoc analysis of Trainer treatment means. Conditions with common underline are not significantly different from each other.

TABLE 2

Individual Data for Type of SIB, Most Effective Treatment, and Percent Reduction

Student	Type of SIB[1]	Most Effective Treatment[2]		BI	% Reduction
TC	S	RW	1.3	23.4	92.3
JW	B	DRI	1.0	7.6	85.7
MF	S	OC	6.8	161.0	95.8
MC	B	RW	57.5	583.4	90.1
BS	S	RW	2.2	49.2	95.6
TG	S	OC	28.9	132.0	78.1
JA	B	OC	10.8	25.0	56.8
JT	S	DRI	35.2	85.2	58.7
RL	S	RW	6.6	308.2	97.9
WM	S	OC	82.3	129.2	36.3
PR	S	OC	3.3	15.0	78.8
MS	B	B1	3.2	1.4	0.0
GS	B	OT	2.5	18.0	86.1
NC	S	OC	161.5	539.6	70.1
BZ	S	OC	2.8	29.8	90.6
Mean			27.1	140.0	80.6

1 S=Head Striking, B=Hand Biting

2 B1=Baseline 1, B2=Baseline 2,
RW=Reinforcement Withdrawal, OT= Omission Training,
DRI= Differential Reinforcement of Incomaptible Behavior,
OC=Overcorrection

body punching primarily to the head area. Table 2 shows the mean score in BI for each subject and the mean score for the most effective treatment condition. Then, the percent reduction in SIB is calcualted in the last column. First, it is evident that there was considerable reduction ($\underline{M}$=80.6%) from BI to the most effective treatment. Of the 15 subjects, 13 showed greater than 50% reduction in SIB. The one child who demonstrated zero reduction had the lowest initial rate of self injury ($\underline{M}$=1.4) for the sample. An analysis of the most effective treatment across the sample partially contradicts the trends for the group analysis. For example, RW was the most effective treatment in four instances. OT was most effective once and DRI twice. OC was most effective eight times. It can be remembered that in terms of the group mean scores RW was the least effective treatment. In the individual analysis, though, RW was the second most frequently successful procedure. DRI and OT were relatively unsuccessful in the individual analysis compared to their group mean scores. OC was consistently the most effective treatment according to both the individual and group analyses. The discrepant results for RW would indicate that for four particular individuals it was quite successful, while for the remainder of the sample it was the least effective technique.

An analysis of trends of the Phase I TR data was also performed. Calculating treatment effects solely through visual inspection and means analysis can be a limited approach because it fails to account for data trends within the particular treatment conditions. For this reason, the "quarter intersect" method (White and Liberty, 1971) of trend analysis was completed on all of the Phase I treatment conditions. The slopes were plotted for the 15 individual graphs and appear in Appendix C.

A summary of the trend data is tabulated in Table 3. An upward trend for a treatment condition was indicated when the slope celeration line exceeded x2.0. A downward trend was scored when the slope celeration line exceeded ÷2.0. A horizontal trend had celeration slope lines ranging between ÷2.0 and x2.0.

Table 3 shows that, overall, there was a relatively equal number of downward, upward, and horizontal trends across treatment conditions, $\underline{X}^2$ (2)=2.0, $\underline{ns}$. For the most effective treatment procedures, though, there were significantly more horizontal trends in the data set, i.e., upward = 4, downward = 0, and horizontal = 11; $\underline{X}^2$ (2) = 12.4, $\underline{p}< .01$. Thus, the most effective treatment procedures exhibited a plateau or asymptotic trend across the treatment sessions. This was particularly true for the most effective procedure, OC, where six of the seven data sets had horizontal trends.

Phase 2. Data for Phase 2 was collected from 9 of the 16 subjects from Phase 1. Four of the children did not participate in Phase 2 because they began Phase 1 in the middle of the school year. Thus, Phase 1 nearly lasted until the beginning of the summer break. Two of the children left their school at the end of Phase 1; thus precluding continuation to Phase 2.

The actual treatment procedures applied in Phase 2 differed from individual-to-individual. Table 4 reports the actual procedures used for each of the nine subjects. Often conjunctive schedules of reinforcement were applied where a punishment procedure like OC was combined with a positive procedure like OT. In this case the subject would receive a positive consequator for not emitting SIB and also would be overcorrected contingent upon a self-injurious response.

TABLE 3

Frequency[1] of Types of Trends in Phase I Data

Trend	B1[2]	B2	DRI	OT	OC	RW	Total
Upward	6	5	2	2(1)	5(1)	5(1)	25(4)
Horizontal	3(1)	3	9(2)	9	6(6)	6(3)	36(11)
Downward	6	7	4	4	4	4	29(0)

[1]Numbers in parentheses indicate frequency of trend for the most effective treatment conditions.

[2]Treatment abbreviations: B1=Baseline 1, B2=Baseline 2, RW=Reinforcement Withdrawal, OT=Omission Training, DRI=Differential Reinforcement of Incompatible Behavior, OC=Overcorrection.

TABLE 4

Frequency of Successful and Unsuccessful Interventions with Teachers and Parents in Phase 2

Outcome	Intervention Agent	
	Parents	Teachers
Successful	3	5
Unsuccessful	5	2

Six of the nine subjects received treatment in both the TC and PR conditions. The three remaining children received treatment in only one condition because: (a) there was zero SIB in the home (JA), (b) reliable treatment methodology could not be obtained in the home due to language, geographical, and time factors (GS), and (c) SIB was never successfully reduced in the PR setting, which precluded its introduction in the TC setting (WM).

Significant (through visual inspection) differences between baseline and treatment conditions were evident in seven of the nine subjects (see graphs in Appendix D). Table 4 tabulates the specific number of successes and failures of treatment in the TC and PR settings. Failure was defined as no noticeable shift from baseline with respect to level (mean) or trend measures. It is evident that the TCs were more successful than the PRs in reducing SIB.

Secondary Measures

A number of correlation coeffeicients were calculated in order to show the relationships between self-injury and adaptive behavior, and self-injury and the home environment. More specifically, indices of SIB were taken from the B1 (Phase 1) level of SIB (S_1) and the percent change in SIB between B1 and the most effective treatment condition (ΔS). Adaptive behavior measures were similarly obtained from the pretest score in the PAC in Phase 1 (P_1), and the difference between pretest and posttest score (ΔP). The posttest score was obtained at the end of Phase 1. The environmental stimulation in the home score (H) was the stanine score produced from administration of the HOME inventory.

Table 5 presents the intercorrelation matrix of the five variables. A couple of interesting relationships emerged. First, change in adaptive behavior was negatively correlated with home environment. This implies that children from the lowest home environments showed the greatest improvements in adaptive behavior over a four to five month period. It should also be remembered that as a group, the home environments of the total sample were below average (mean H = 3.5). Second, children from lower home environments tended to have higher initial SIB scores and also demonstrate greater reductions in SIB (the negative r between S_1 and H, and ΔS and H). Third, children with higher initial SIB rates showed greater positive changes in adaptive behavior. Although these correlations were not subject to a factor analysis (due to the small sample size), it appeared that a certain cluster of relationships emerged. That is, children from lower home environments entered with higher SIB rates and proceeded to demonstrate greater positive changes in adaptive behavior and SIB reduction.

TABLE 5

Intercorrelation Matrix of Secondary Measures and SIB[1]

Variables[2]	P_1	ΔP	H	S_1
Δ P	-.409			
H	.183	-.699 **		
S_1	-.219	.498*	-.338 *	
Δ S	.136	.112	-.449 *	.314

[1] Single asterisks indicate significance at the .20 level level and double asterisks at the .02 level.

[2] P_1=PAC pretest; Δ P=change in PAC; H=HOME; S_1=mean SIB (Baseline 1); Δ S=change in SIB (Baseline 1 - most effective treatment).

DISCUSSION

The most striking effect of the first year's data was the preeminent effectiveness of the OC procedure. This superiority was reflected in both the group and individual analysis of the data. An attempt will be made in this section to give a more conceptual and theoretical account of the OC and other results of the project.

In attempting to analyze the critical components of OC there appears to be two important factors. For one, OC is the only technique where an aversive stimulus is contingently applied. There are a number of studies demonstrating the efficaciousness of punishment in suppressing aberrant behavior with severely handicapped children. In these studies the degree or intensity of punishment has varied. At one extreme, Lovaas and Simmons (1969) have applied electric shock. Studies using contingent electric shock or other strong aversive stimuli like arromatic ammonia have often shown rather abrupt and complete suppression of the aberrant behavior (Baumeister & Forehand, 1976). When leaving the bounds of intensive aversive stimuli, the next most aversive procedure would be OC as developed by Foxx and Azrin (1973). This technique entails the manual control over a client's behavior as he/she is put through a regime of calisthenic-like exercises. Besides the degree of manual guidance involved, OC often has a 5-20 minute duration. In this sense the procedure referred to in the present project as OC is not truly overcorrection. The OC procedure here could more accurately be characterized as contingent restraint (cf. Schroeder & Humphrey, 1977). Contingent restraint entails holding a body part like the arm in a fixed position. In the present study it lasted for one minute. Contingent restraint can thus be viewed as a less punishing stimulus than OC because of its shorter duration and because of the absence of guided physical movement. It is similar to OC in that it involves a verbal command and manual guidance with fading. At the least intense level of punishment would be a quick slap or movement of the hands down accompanied by a verbal command "no" or "hands down." This quick procedure has been shown to reduce self stimulatory behavior by Koegel and Covert (1977). This must be viewed as the least punishing stimulus because of its short duration and minimal manual guidance.

The second important component of both OC and contingent restraint is the counter-control obtained of the subject's behavior. Assuming that SIB can be used as a manipulative tactic, OC was the only procedure in this project where the TR physically intervenes to control the expression of the subject's behavior. Of course, this counter-control function could operate as a punishing stimulus and thus be viewed as equivalent to other punishment procedures. I would choose to make the distinction that OC, in addition to having this punishing characteristic, also exerts a counter-controlling function that operates above and beyond punishment. This counter-controlling function will be analyzed in more theoretical detail below.

Theoretical Analysis

E. Carr (1977) has recently outlined the two major operant mechanisms that can maintain SIB. The mechanisms are positive reinforcement and negative reinforcement. When positive reinforcement is operative there is

continuous or intermittent positive consequation of self-injurious responses. The type of positive consequation is typically social attention by the child's immediate caretakers.

Most important for the present discussion are the implications for treatment from such a positive and negative reinforcement analysis. In the case of positive reinforcement it would seem that treatment techniques that broke the response-social reinforcer bond should reduce SIB. One would expect such a reduction because of extinction. An extinction program would have direct care personnel ignore the SIB. One problem with extinction in natural settings is that an individual may inadvertantly reinforce a self-injurious response. Such an action would place the child on an intermittent schedule of reinforcement. Intermittent schedules maintain high and durable response rates. Therefore, a more active and systematic approach to extinguish SIB may be warranted. A total extinction approach reported by Jones, Simmons, and Frankel (1974) involved placing the person in complete isolation for long (six hour) periods of time. In this way there was no possible chance for social contingencies to occur. Another type of isolation procedure is timeout. In timeout, contingent upon a particular aberrant response, the subject is removed for a fixed period of time to an isolated area or room. Timeout removes the person from contact from all positive reinforcers but may also involve intense physical struggles with larger clients, and may thus inadvertantly reinforce the behavior through such physical contact. RW tries to extinguish a particular behavior by contingently removing a specific positive consequator. Tokens or social interactions (as in the present project) are contingently removed after the emission of a response. In RW, though, the clinician or experimentor is making a stronger hypothesis that a particular stimulus is in fact reinforcing and maintaining the SIB. Timeout, in contrast, removes all possible reinforcers.

Interestingly, RW was the least effective technique in the group analysis of the results. But in the individual analysis RW was the most effective technique for four subjects. It is argued here that RW did not reduce SIB in these clients because of extinction of positive (social) reinforcements. Rather, as will be argued below, SIB had been maintained by a negative reinforcement paradigm. RW, then, reduced SIB because of its imposition on the negative reinforcement schedule.

Before discussing negative reinforcement, though, the relationship between positive reinforcement and techniques emphasizing positive consequation should be addressed. In the present study DRI was applied under the assumption that alternative, constructive behaviors would be strengthened and compete with SIB. The DRI procedure has the advantage that alternative behaviors can be prompted and reinforced so that it is unlikely that the person will emit SIBs at the same time that alternative responses are produced. One problem with this logic that appeared in some actual cases in the study was that SIB could alternate on a second-to-second basis with the production of task responses. The question of whether severely handicapped children can make substantive gains in learning before aberrant behaviors have been suppressed has yet to be resolved. Koegel and Covert (1972) found substantive improvements in discrimination learning only after self-stimulatory behaviors were removed with a mild punishment technique.

tinued at their baseline rate. The resolution of this issue largely depends on the parameter of response duration. In the present project some children were observed to emit long bursts or chains of SIBs that might last minutes. Under these circumstances no on task responses could occur. Yet, these children might stop responding for a number of minutes and return to task. A second group of children would emit short duration responses that lasted a second or two. In many of these cases the child would alternate from second-to-second between SIB and on task behavior.

Probably the most limiting aspect of positive consequation treatments lies in the ability to identify a strong reinforcer. Because of their heterogeneity and low level of functioning, it is not possible to generalize about what are positive consequators for severely handicapped children. Although edibles have often been used, many times they are rejected and not functionally reinforcing to the severely handicapped. I have found that as the severity of the handicap increases, it becomes necessary to move to reinforcers using physical, kniesthetic, vestibular, and other sensory reinforcing qualities. In some cases one may never quite find a prepotent incentive. In the one case where minimal reductions in SIB were obtained (WM), it was felt that no reinforcer had been found that could gain stimulus control over the child. Therefore, the unknown reinforcers that are maintaining the SIB remain more potent than the reinforcers being manipulated by the experimenter. If this is the case, it is unlikely that the SIB will be effectively eliminated through positive consequation.

Negative reinforcement. A second schedule that can maintain SIB is negative reinforcement. In this paradigm some negative or aversive event must appear in the milieu of the child. The child then emits a self-injurious response which effectively eliminates the aversive event. Negative reinforcement thus operates as an escape conditioning or mechanism, e.g., SIB can prevent the onset or terminate the duration of an aversive event. The maintenance of SIB through negative reinforcement can operate when the aversive events are physical harassment, task demands, or general social interaction. E. Carr, Newsome, and Binkoff (1976) demonstrated how SIB would dramatically increase as a function of verbal mands. In a similar way, Gaylord-Ross and Weeks (1977) showed how SIB could increase as a joint function of verbal commands and a non-preferred task. It has also been my experience to observe children who have been isolated on back wards to find social interaction aversive, and subsequently use SIB or some other aberrant behavior to avoid social interaction.

There are a number of implications from the negative reinforcement paradigm for specific treatment procedures. First, positive procedures like DRI and OT could only have immediate effects if the programmed positive consequators were powerful enough to outweigh the aversive qualities of the social interaction. Since this is often not the case, one could foresee positive approaches gradually reducing the aversiveness of the interaction through systematic reinforcement over long periods of time. In this way, it could be anticipated that antecedent manipulations of verbal instructions and task properties could reduce the aversive quality of the interaction and concomitantly decrease SIB.

Second, a direct punishment procedure like OC (or contingent restraint) could have an immediate effect upon eliminating SIB. In these punishment procedures manual guidance is maintained over the subject. It thus becomes impossible for the person to use SIB to escape or avoid the interaction with the TR or other caretaker. Therefore, SIB as a manipulation technique to avoid social interaction may quickly extinguish within a few trials of failing to avoid interaction. It is of course possible that the punitive aspects of OC (manual control) may combine with the extinction of a negative reinforcement schedule to produce a powerful treatment package.

Third, the effectiveness of RW can be viewed in the context of the negative reinforcement paradigm. In the present project, in RW sessions a self-injurious response led to the TR leaving the immediate area of the child for a one minute period. If the interaction with the TR was aversive for the child, the RW contingency should in fact strengthen the negatively reinforced properties of SIB by systematically terminating the interaction. For five children this phenomenon appeared to be happening. That is, when the TR worked with the child there was a good bit of collateral emotional behaviors indicating the interaction was not pleasant. After a SIB occurred the child calmed down while the TR was out of the area. In two cases (MC and JA) the child began to SIB periodically. That is, one self-injurious response was emitted and the TR left the areas. During the one minute period no SIBs occurred. As soon as the TR returned for interaction the child would immediately emit one SIB. This cyclical pattern continued throughout the therapy session. This cyclical demonstration of SIB in two cases is interesting in a research context but probably of limited educational value. It is unlikely that one would advise a TC to leave the child alone whenever SIB appeared. This is what happeded in one case (BS). The teachers left BS alone not only during episodes of SIB, but generally throughout the school day. When such a development occurs, the manipulative powers of aberrant behaviors like SIB become strongly established through negative reinforcement conditioning.

Treatment and individual differences. The two major interpretations of the maintenance of SIB, positive and negative reinforcement, have been reviewed and integrated with the present data. At present, it would seem that there is more clearcut clinical and research evidence for identifying cases under the control of negative reinforcement. With negative reinforcement the SIB is often accompanied by negative emotional behaviors indicating resistance to the particular interaction. The SIB is used in a manipulative way to escape/avoid such encounters. Positive consequation techniques are often less successful because the reinforcement value of the consequators is not nearly as potent as the aversive value of the interactional stimuli. RW or other isolation techniques like timeout are likely to reduce SIB because the isolation procedure functions to terminate the interaction in a negative reinforcement manner. OC and other counter-control procedures like contingent restraint may serve to reduce SIB because they prevent the subject from physically escaping the interaction.

Besides identifying a subgroup of persons using SIB in an escape/avoidance manner, no other clear subgroup of self-abusers emerged (suggestive correlational indices did appear in the secondary measures and are discussed below). One other major trend did appear in the Phase 1

data. In a consistent manner (group means) SIB was reduced markedly when moving from B1 to B2. Apparently engaging the child in task activity in a one-to-one setting forces him/her to emit alternative behaviors that preclude the simultaneous emission of SIB. Somewhat paradoxically, all of the subjects identified as under the control of negative reinforcement showed this pattern. It is possible that the interaction of B2 engaged them in task activity that precluded simultaneous SIB. At the same time specific aspects of the interaction like instructional demands and task properties may have elicited SIB. This effect was documented in one subject (MC) in a separate report (Gaylord-Ross & Weeks, 1977). Certainly, further research is needed to better delineate this pattern of results.

In conclusion, it appears that three recommendations for treatment have emerged from the Phase 1 data. First, the child should be programmed in a social and educational interaction as much as possible. When SIB appears the TCs /aides should continue "working through" on the task so that negative reinforcement does not occur. As a corollary to this recommendation, educational materials and instructional commands should be programmed in a gradated fashion so that aversive materials and commands are initially avoided but gradually faded in over time. Second, a punishment procedure should be contingently applied with the appearance of the SIB. Third, an exacting effort should be made to identify maximally reinforceing stimuli. When maximally reinforcing stimuli are identified and contingently applied to on task responses, the appearance of alternative, constructive behaviors will be greatly enhanced. At the same time, through a response competition notion, the probability of the appearance of SIB will be reduced.

Phase 2

The general results of Phase 2 were promising in that they showed that TCs and PRs are capable of implementing behavior modification techniques to reduce self-injury. Furthermore, seven of the nine subjects demonstrated noticeable reduction in SIB in at least one of the TC/PR conditions. More specifically, TCs showed greater success than PRs in significantly suppressing SIB. The greater success of TCs is probably due to their better training in administering behavioral and other educational techniques. It is also possible that there was greater generalization from the TR (Phase 1) session to the TC intervention (Phase 2) session because of the similarity of the classroom setting. It must be remembered, though, that no significant generalization of SIB reduction occurred in Phase 1 from TR to either TC or PR sessions. This lack of generalization is both discouraging, but to be expected from the principles of operant conditioning (Baer, Wolf, & Risley, 1968). Namely, generalization or transfer of treatment effects should not occur unless they are specifically programmed. The lack of generalization in the present study should also be predicted because of the short therapy sessions. J. Carr (1975) has stated that when one is trying to reduce aberrant behavior, a round-the-clock intervention should be instituted.

This will increase the chances of completely eliminating the response from the person's repertoire. In contrast, when working to increase skill behaviors, distributed practice sessions, e.g., 20-30 minutes, can be quite successful. Thus, the present study probably falls short of this criterion of eliminating aberrant behaviors because of the short therapy sessions. Still, severely handicapped children are capable of making discriminations of when therapy contingencies and settings are operative and when they are not in effect (cf. Rollings, 1975). Thus, reliable treatment effect can be expected (and were obtained) within the confines of the treatment setting.

Also, the Phase 2 data demonstrated the potential of combining two schedules of reinforcement conjunctively in order to more effectively reduce SIB. Typically, a punishment procedure like OC was conjunctively paired with a positive procedure like DRI. In this way the beneficial treatment effects of both reward and punishment procedures can be maximized in one treatment package.

Secondary Measures

A number of interesting and suggestive relationships emerged from the intercorrelations among the SIB, PAC, and HOME measures. The correlational data found that children coming from homes where there was less environmental enrichment tended to have higher rates of SIB. In addition, these low H students showed greater improvements in adaptive behavior and SIB reduction over a four-five month period. The data fit a general environmental hypothesis stating that SIB and other aberrant behaviors are a product of deprived, understimulating environments. It should also be remembered that the mean H score for the total sample was one and one half standard deviations below the mean. Thus, SIB seems to be related to less stimulating residential milieus. An encouraging finding was that these lower H students showed the greatest changes in adaptive behavior and SIB reduction. The correlational nature of this data could not identify the cause of these outcomes. It is possible that exposure to the general school program compensated for low H and tended to reduce SIB and improve PAC scores. Higher H subjects could be less responsive to general school programs because of the adequate levels of stimulation received in the home. It is also possible that the specific intensive therapy received in relation to the current project led to significant changes in the low H group in terms of Δ S and Δ P. There is certainly a need for further research in this area.

SUMMARY STATEMENT AND SECOND YEAR PROJECTIONS

The first year annual report for the SIB project has attempted to summarize and interpret the collected data. The primary finding was that OC tended to be the most effective treatment procedure in reducing SIB. In all but 2 of the 15 subjects, though, at least one treatment emerged to significantly reduce the baseline rates of SIB. The punishment and counter-controlling components of OC were emphasized when interpretting its effectiveness.

Phase 2 of the study also showed that TCs and PRs can be effective behavioral recorders and modifiers in dealing with a behavior like self-injury. TCs proved to be more effective in significantly reducing levels of SIB.

One subgroup of self-injurious children seemed to emerge. Both clinical and research observations tended to show negative reinforcement maintaining SIB in five particular children. The effectiveness of OC and RW in reducing SIB for these escape/avoiders was discussed. A second group of children emitting SIB was less clearly defined by the collected data. Theoretically, SIB should be maintained by some type of positive reinforcement schedule. Clinical and research observations did not clarify whether an actual external reward was operative or whether intrinsic reinforcement was derived from the SIB.

Intercorrelations from the secondary measures presented some suggestive findings. Children from homes where there was lower environmental stimulation had higher initial rates of self-injury. Such a finding supports a general environmental hypothesis that aberrant behavior is produced in milieus where there is little environmental stimulation. Other correlations showed the low H subjects to manifest the greatest improvements in adaptive behavior and the largest reduction in SIB. It was specualted that such changes could be due to the greater responsivity of the low H students to the general school program or to the specific impact of the SIB project.

An additional case study was conducted on one subject (MC) to investigate the specific experimental variables maintaining SIB. This report appears in Appendix E. Through extensive videoanalysis it was found that SIB was maintained through a negative reinforcement schedule. Specifically, a particular non-preferred task combined with instructional demands to lead to the emission of SIB. When such tasks and demands were absent, SIB was absent.

The Second Funded Year

Throughout this report a focus has been placed on the reduction of aberrant behavior. It has also been emphasized that the acquisition of skills covaries in some way with the reduction of SIB. How these behavioral clusters covary is still an unresolved question in research dealing with the severely handicapped. In the second funded year an attempt will be made to monitor skill acquisition as well as SIB reduction in the subjects. The same procedures and design will be implemented as in the first year. In addition, a series of instructional objectives

will be delineated for each subject. Progress through the list of instructional objectives will be recorded and correlated with changes in levels of SIB. It is hypothesized that when growth spurts occur in mastering instructional objectives, there will be concomitant reductions in SIB. A dissertation carried out by one of the project staff members, Marian Weeks, and supervised by the PI, will also explore this question.

DISSEMINATION OF FINDINGS

First year results from the project have been disseminated through a number of channels. First, findings have been informally shared with colleagues and students at Yeshiva University and at other university and clinical settings. Also, formal colloquia presenting the project's findings were given at Yeshiva University and at the University of Wisconsin—Madison, Department of Studies in Behavioral Disabilities. Second, two formal papers were presented at conferences. "The Treatment of Self-Injurious Behavior with Overcorrection, Extinction, Omission Training, and Positive Reinforcement Procedures" was delivered at the Gatlinberg Conference on Research in Mental Retardation, Gatlinberg, Tennessee, March 1977. The paper "Self-Injury: an Analysis of Antecedent and Consequating Events" was presented at the convention of the American Association on Mental Deficiency, New Orleans, May 1977. Third, two papers have been written and submitted for publication. Both papers appear in Appendix E. The first paper, "An Analysis of Antecedent, Response, and Consequationg Events in the Treatment of Self-Injurious Behavior, " by Robert Gaylord-Ross and Marian Weeks, is a case study report of the videotape analysis of MC. "Mental Retardation Research, Ecological Validity, and the Delivery of Longitudinal Educational Services" is a position paper written and submitted by the PI during the first fiscal year. Fourth, publicity about the program has been disseminated through Yeshiva Unversity publications and through an article appearing in the New York Post.

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APPENDIX A

Consent Form,

Data Sheets,

and

Instructions

YESHIVA UNIVERSITY

FERKAUF GRADUATE SCHOOL
OF HUMANITIES AND SOCIAL SCIENCES
55 Fifth Avenue / New York, N.Y. 10003 / (212) 255-5600

DEPARTMENT OF SPECIAL EDUCATION

CONSENT FORM
YESHIVA UNIVERSITY SELF-INJURY PROJECT

Dear Parent:

We are glad that you have indicated an interest in having both you and your child participate in the Yeshiva University Self-Injury Project. The project has been officially funded by the United States Office of Education, Bureau of Education for the Handicapped. The grant has been awarded to Dr. Robert Gaylord-Ross of the Yeshiva University Special Education Department.

At this time we would like you (either parent or guardian) to formally indicate your consent for your child to participate in the project. Kindly fill in the name of your child, your signature and the date.

I HEREBY GIVE PERMISSION AND CONSENT FOR MY CHILD_____

TO PARTICIPATE IN THE YESHIVA UNIVERSITY SELF-INJURY PROJECT.

_____(Parent or Legal Guardian)

_____Date

YESHIVA SELF-INJURY PROJECT
DR. ROBERT GAYLORD-ROSS

Comprehensive Data Sheet

Subject's Name_____ Age_____
(Years - months at start of project)

Diagnostic Classification_____ IQ (if testable)____

Age when SIB began_____

Rating of parent and teacher as effective recorder and behavior modifier (circle one)

Teacher	1 poor	2 fair	3 good	4 excellent
Parent	1 poor	2 fair	3 good	4 excellent

Response (SIB) definition:

Reinforcer (in OT and PR):

Type of Overcorrection: 1 minute or a few seconds
(circle one)

Educational tasks
(If one or a couple of particular activities were used, describe)

Was SIB periodic during TO? Yes No
(circle one)

Comments about successes and failures of project for the client; either treatment related or other observations (use back of sheet):

YESHIVA SELF-INJURY PROJECT
DR. ROBERT GAYLORD-ROSS

Treatments (Mean Scores)

	B	B1	B2						
Trainer									
Teacher									
Parent									

Reliability

		N	$\bar{X}$	Med
Trainer				
Teacher				
Parent				

PAC

	Pretest (Date:)	Posttest (Date:)
Self-Help		
Communication		
Socialization		
Occupation		
Personality		
Total		

HOME

	Pretest (Date:)		Posttest (Date:)	
	Raw	Stanine	Raw	Stanine
I				
II				
III				
IV				
V				
VI				
Total				

Client_____

Trainer_____

YESHIVA UNIVERSITY - SELF-INJURY PROJECT

Dr. Robert Gaylord-Ross

Consolidated Behavioral Recording Sheet

Condition									
Date									
Trainer									
Teacher									
Parent									

Condition									
Date									
Trainer									
Teacher									
Parent									

Condition									
Date									
Trainer									
Teacher									
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Condition									
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Trainer									
Teacher									
Parent									

Condition									
Date									
Trainer									
Teacher									
Parent									

Condition									
Date									
Trainer									
Teacher									
Parent									

Child's Name

Recorder

Self-Injury Project
Dr. Robert Gaylord-Ross
Special Education Department
Yeshiva University

Trainer Recording Sheet (Daily)

Condition	Date	Time	Number of Responses		Number of Reinforcers	R_2

Self-Injury Project
Dr. Robert Gaylord-Ross
Special Education Department
Yeshiva University
Parent and Teacher Recording Sheet

Child's Name_____

Recorder_____

Date	Time	Number of Responses	Date	Time	Number of Responses

Self-Injury Project
Dr. Robert Gaylord-Ross
Special Education Department
Yeshiva University

Procedure (Trainer's form)

1. At the first meeting with the parents and teachers explain the general objectives of the research project;
   a. To reduce and eliminate SIB through different treatment procedures (behavior modification)
   b. To involve parents and teachers in the treatment package

2. Explain that parents and teachers will;
   a. operate as recorders throughout the project
      (1) This is to get an index of how frequent the behavior is.
      (2) To assess transfer of treatment effects.

3. Tell them that later into the project they will be asked to provide treatment.

4. Explain the general design:
   a. of 3, $\frac{1}{2}$ hour sessions each school day
   b. They will be asked to record behavior at approximately the same time each day
      (1) Tell parents to try to attain this objective (within reason)
      (2) If they are busy at that time, though, they should feel free to record at another time.
      (3) Home recording can be at any time after school and before bedtime. It should not be during a meal.

5. Tell them that the 3 essentials of recording are a golf counter, a kitchen timer, and a recording sheet (which we will supply).
   a. explain and demonstrate how the counter and timer work
   b. try to place timer away from child so that no ticking (an S^D) can be heard.

(continued)

Procedure (Trainer's form)

5. c. Explain to the parents that they must be in the room where the child is during ½ hour. Feel free, though, to conduct normal activities.

d. In the same manner the teachers should conduct normal activities while recording but, make sure the child is in their immediate working group (whether small or large).

e. At the end of the half-hour session they should immediately record

(1) The time and ate the session ended

(2) The number of SIBs

f. Place timer, counter, and sheet in a safe place when not in use.

6. Tell the parents that you will be consulting in the home about once per week. Tell the teachers you will be circulating to give advice. Give parents your phone number for questions.

7. Ask parents to sign consent form.

APPENDIX B

PAC and HOME

Assessment

Forms

HOME INVENTORY (Birth to Three)
(Home Observation for Measurement of the Environment)

Child's Name _____ Date of Interview _____

Child's Birthdate _____ Interviewer _____

Relationship of Person interviewed to child _____ Place of Interview _____

Family Composition _____
(Indicate persons living in household, including sex and age of children)

Persons present in home at time of interview _____

Comments _____

STANINES (N = 124)

RAW SCORES	1	2	3	4	5	6	7	8	9	Mean	S.D.
I	1-3	4	5-6	7	8	9	10	11	-	7.8	2.3
II	1-2	3	4	5	-	6	7	8	-	5.5	1.5
III	1-2	3	-	4	5	-	6	-	-	4.8	1.2
IV	1	2	3-4	5	6	7	8-9	-	-	6.1	2.5
V	-	1	2	-	3	4	5	6	-	3.4	1.7
VI	-	1	-	2	3	-	4	5	-	2.8	1.3
Total	20	20-21	22-24	25-28	29-32	33-36	37-40	41-43	44-45	30.4	7.7

Factor	Raw Score	Stanine
I Emotional and Verbal Responsivity of Mother		
II Avoidance of Restriction and Punishment		
III Organization of Environment		
IV Provision of Appropriate Play Materials		
V Maternal Involvement with the Child		
VI Opportunities for Variety in Daily Routine		
Total		

From the Center for Early Development and Education
814 Sherman, Little Rock, Arkansas 72202

	YES	NO
I. EMOTIONAL AND VERBAL RESPONSIVITY OF MOTHER		
1. Mother spontaneously vocalizes to child at least twice during visit (exclude scolding).		
2. Mother responds to child's vocalizations with a vocal or verbal response.		
3. Mother tells child the name of some object during visit or says name of person or object in a "teaching" style.		
4. Mother's speech is distinct, clear, and audible to interviewer.		
5. Mother initiates verbal interchanges with observer -- asks questions, makes spontaneous comments.		
6. Mother expresses ideas freely and easily and uses statements of appropriate length for conversation (e.g., gives more than brief answers).		
* 7. Mother permits child occasionally to engage in "messy" types of play.		
8. Mother spontaneously praises child's qualities or behavior twice during visit.		
9. When speaking of or to child, mother's voice conveys positive feeling.		
10. Mother caresses or kisses child at least once during visit.		
11. Mother shows some positive emotional responses to praise of child offered by visitor.		
SUBSCORE		
II. AVOIDANCE OF RESTRICTION AND PUNISHMENT		
12. Mother does not shout at child during visit.		
13. Mother does not express overt annoyance with or hostility toward child.		
14. Mother neither slaps nor spanks child during visit.		
** 15. Mother reports that no more than one instance of physical punishment occurred during the past week.		
16. Mother does not scold nor derogate child during visit.		
17. Mother does not interfere with child's actions or restrict child's movements more than three times during visit.		
* 18 At least ten books are present and visible.		
* 19. Family has a pet.		
SUBSCORE		

* May require an interview probe unless can be observed.
** Will require interview probe unless mother mentions spontaneously

		YES	NO
	III. ORGANIZATION OF PHYSICAL AND TEMPORAL ENVIRONMENT		
**20.	When mother is away, care is provided by one of three regular substitutes.		
**21.	Someone takes child into grocery store at least once a week.		
**22.	Child gets out of house at least four times a week.		
**23	Child is taken regularly to doctor's office or clinic for check-ups and preventive health care		
*24.	Child has a special place in which to keep his toys and "treasures."		
25.	Child's play environment appears safe and free of hazards.		
	SUBSCORE		
	IV. PROVISION OF APPROPRIATE PLAY MATERIALS		
*26.	Child has one or more muscle activity toys or pieces of equipment.		
*27.	Child has push or pull toy.		
*28.	Child has stroller or walker, kiddie car, scooter, or tricycle.		
29	Mother provides toys or interesting activities for child during the interview.		
*30.	Provides learning equipment appropriate to age -- mobile, table and chairs, high chair, play pen.		
*31	Provides learning equipment appropriate to age -- cuddly toy or role-playing toy.		
*32.	Provides eye-hand coordination toys -- items to go in and out of receptacle, fit together toys, beads.		
*33.	Provides eye-hand coordination toys that permit combinations -- stacking or nesting toys, blocks or building toys.		
*34.	Provides toys for literature and music (books, records, toy musical instruments).		
	SUBSCORE		
	V. MATERNAL INVOLVEMENT WITH CHILD		
35.	Mother tends to keep child within visual range and to look at him often.		
**36.	Mother "talks" to child while doing her work.		
*37.	Mother consciously encourages developmental advance.		
*38.	Mother invests "maturing" toys with value via her attention.		
**39.	Mother structures child's play periods.		
*40.	Mother provides toys that challenge child to develop new skills.		
	SUBSCORE		
	VI. OPPORTUNITIES FOR VARIETY IN DAILY STIMULATION		
**41	Father provides some caregiving every day		
**42.	Mother reads stories to child at least three times weekly.		
**43	Child eats at least one meal per day with mother and father.		
*44	Family visits or receives visits from relatives approximately once a month.		
*45	Child has three or more books of his own.		
	SUBSCORE		